

## The P2 Corner

If you own and operate a fleet of vehicles, you have many opportunities to practice pollution prevention (P2). Some business owners might fear that engaging in P2 activities will cost a lot of money. However, reducing waste, reducing the amount of fuel and oil used, and avoiding expensive repairs (not to mention downtime) can actually save money.



### Maintenance

- ☑ Perform regular maintenance on all vehicles. This action includes tune-ups and inspecting hoses and fuel and oil lines for leaks.
- ☑ When washing vehicles, use environmentally friendly detergents over a floor drain to capture dirt and residue. Waste water should flow to a treatment plant, city waste water facility, or be hauled away by a licensed liquid waste hauler. Dispose of the residue in the trap through a licensed hazardous waste hauler; the dirt will likely contain oil and heavy metals. (For more information contact the LLCHD Special Waste Program, 441-8641.)
- ☑ Unless the vehicle is under a warranty that requires a specific schedule of oil changes, change oil only when necessary. Test the viscosity and the quality of the oil. If the oil is excessively dark or gritty, it should be replaced. You might still need to change oil filters according to manufacturer's specifications to prevent damage and to add life to the motor oil. (See related article, "Fleet Oil Sampling and Changing" on page 3.)



## KEEP THE FLEET SHIPSHAPE

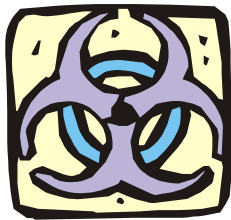
- ☑ Explore the possibility of using synthetic oil.
- ☑ Change antifreeze only when necessary. Test the cooling protection of the antifreeze. Inspect the antifreeze for grit and dirt.
- ☑ Recycle all used motor oil and antifreeze.

### Reduce Gas Use and Air Pollution

- ☑ Shut off engines when making deliveries or waiting in a line to load or unload.
- ☑ Don't idle engines more than necessary. Cut down on warm-up times. Most newer vehicles are designed to warm up quickly. Often the best warm-up is to drive the vehicle. Do not idle for more than a minute.
- ☑ Keep your tires properly inflated. You will have to replace tires less often and vehicles will have improved fuel efficiencies.
- ☑ Refuel when it's cool, in the morning or evening. When the air temperature is warm, fuel evaporates faster.
- ☑ Don't top off your gasoline tank. Trying to add that last drop could cause spills and allows gas vapors to escape from the tank.
- ☑ Consider buying or leasing low-emission and fuel-efficient vehicles. Larger vehicles (buses, trucks, limousines, and vans) are not as fuel-efficient as some small and midsize family cars. If you update fleets, you might be able to find suitable vehicles that are more fuel-efficient than existing ones. You do not have to replace the entire fleet at once. Phase in new vehicles to ease financial burdens and to test their efficiencies and suitability to your business needs.



## WASTE MINIMIZATION PRIORITY CHEMICALS



Pollution emissions often contain one or more of the 30 chemicals or compounds identified by the EPA as posing human health or environmental risks. The EPA has identified 27 organic chemicals or compounds and three metals as the highest priorities for waste minimization. “The organic chemicals included in the list of Waste Minimization Priority Chemicals were selected following an Agency-wide expert review of scientific information available on these chemicals.

These organic chemicals are *persistent*, *bioaccumulative*, and *toxic (PBT)*. PBTs tend to

remain (are *persistent*) in the environment or in an exposed organism (human, animal, or plant). They can enter an organism’s system when it breathes, swallows, or absorbs the chemical directly or eats another organism that has been exposed to the chemical.

These chemicals are not easily expelled or digested. When an organism is exposed to more chemicals or eats other exposed organisms, the chemicals build up in the body (*bioaccumulate*). As more chemicals build up in the organism, their toxic effects increase.

The 27 Waste Minimization Priority Chemicals are proven to be *toxic*. They poison and damage living things. Different chemicals produce different affects.

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Priority Chemicals	CASR No.
1,2,4-Trichlorobenzene	120-82-1
1,2,4,5-Tetrachlorobenzene	95-94-3
2,4,5-Trichlorophenol	95-95-4
4-Bromophenyl phenyl ether	101-55-3
Acenaphthene	83-32-9
Acenaphthylene	208-96-8
Anthracene	120-12-7
Benzo(g,h,i)perylene	191-24-2
Dibenzofuran	132-64-9
Dioxins/Furans (considered one chemical)	
Endosulfan, alpha*	959-98-8
Endosulfan, beta*	33213-65-9
* (considered one chemical)	
Fluorene	86-73-7
Heptachlor*	76-44-8
Heptachlor epoxide*	1024-57-3
* (considered one chemical)	
Hexachlorobenzene	118-74-1
Hexachlorobutadiene	87-68-3
Hexachlorocyclohexane, gamma-	58-89-9
Hexachloroethane	67-72-1
Methoxychlor	72-43-5
Naphthalene	91-20-3
PAH Group	
Pendimethalin	40487-42-1
Pentachlorobenzene	608-93-5
Pentachloronitrobenzene	82-68-8
Pentachlorophenol	87-86-5
Phenanthrene	85-01-8
Pyrene	129-00-0
Trifluralin	1582-09-8
<b>Metals and Metal Compunds</b>	
Cadmium	7440-43-9
Lead	7439-92-1
Mercury	7439-97-6

## UNDERSTANDING CANCER RISK

One measure of the risks posed by a chemical or a pollutant, is the risk of causing cancer (is a *carcinogen*). The EPA relies on medical reports and life-style history to analyze exposures to determine if a substance is likely to cause cancer.

Even if no direct proof exists that a substance causes cancer, it might be classified as a carcinogen because it is chemically similar to another known carcinogen. The Material Safety Data Sheet (MSDS) and official labels and warnings will carry some indication of the substance’s cancer causing risk.

Chemical are placed into one of the following categories:

- ❖ **Group A**—Human carcinogen
- ❖ **Group B1**—Probable human carcinogen, limited human data are available
- ❖ **Group B2**—Probable human carcinogen, sufficient evidence in animals and inadequate or no evidence in humans
- ❖ **Group C**—Possible human carcinogen
- ❖ **Group D**—Not classifiable
- ❖ **Group E**—No evidence exists that it is a human carcinogen



## FLEET OIL SAMPLING AND CHANGING

(The following article was modified from *Fleet Motor Pool Pollution Prevention Guide*, prepared for the Army Environmental Center. Although prepared for the U.S. Army, the guide contains information that applies to civilian fleets as well. It can be accessed on the internet at <http://www.afcee.brooks.af.mil/eq/programs/summary.asp?rscid=326>.)

To determine if oil needs to be changed, employees or drivers responsible for fleet maintenance should take samples of motor oil on a regular basis. The United States Army recommends sampling every two months. The Army has determined that



sampling on that schedule reduces costs and vehicle maintenance. The manual provides a calculation based on the assumption that personnel take six samples per year from 100 vehicles, that sampling takes 15 minutes each time, and that labor costs \$25 per hour (including overhead).

$$\frac{6 \text{ samples / vehicle}}{\text{year}} \times 100 \text{ vehicles} \times \frac{5 \text{ min}}{\text{sample}} \times \frac{1 \text{ hr}}{60 \text{ min}} \times \frac{\$25}{\text{hr}} = \frac{\$1,250}{\text{year}}$$



Taking regular oil samples and changing oil and oil filters only when necessary results in many savings. The facility purchases less oil and fewer oil filters. Because there are fewer oil changes, there

is less oil and fewer filters to discard or recycle, further reducing costs.

The Army calculated that sampling oil every two months and reducing the number of oil changes per year reduced oil use by 125 gallons (in a fleet of 100 vehicles). Assuming a price of \$4 per gallon, the Army base saved \$500 per year in oil purchases. Further, this program reduced oil filter use by 100 filters. If the filters cost \$2 each, the base saved an additional \$200 per year using this schedule. The cost of filter disposal was reduced by \$2.50 per year.



Following the schedule proposed by the Army, a business "could reduce the number of oil changes performed from 400 to 300 each year.

Assuming it takes one half of an hour to perform an oil change at a labor cost of \$25 per hour (including overhead), performing 100 fewer oil changes would save \$1,250."

Adding it up (\$500 + \$200 + \$2.50 + \$1250) reveals around \$1953 in savings every year. What makes this program even more attractive is that the payback is immediate. These are costs that are going out now. If you can stop those costs, you save money immediately with no capital outlay. Reduce waste and save time while spending less money is the perfect P2 fix.

*Adapted from:*

*FLEET MOTOR POOL POLLUTION  
PREVENTION GUIDE*

January 1997

U.S. Army Center for Health Promotion  
and Preventive Medicine  
Aberdeen Proving Ground  
Maryland 21010-5422

USACHPPM Project Number 37-EF-4823-96  
Project Officer: Eric Haukdal



## WASTE MINIMIZATION CHEMICALS

(CONTINUED FROM PAGE 2)

Some harm the nervous system while others damage lungs or other organs. Some cause cancers.

The 27 chemicals on the Waste Minimization Priority list currently appear in industrial waste or are found in soil, sediments, ground water, surface water, air, and living organisms. Because of their persistent nature, some chemicals that are no longer used still cause problems years or decades after they were banned. Many are difficult to remove from the environment.



Three metals are included in the list: cadmium, lead, and mercury. As the EPA notes “These metals are known to occur frequently in RCRA [Resource Conservation and Recovery Act] regulated industrial wastes, and often ‘trigger’ RCRA’s Toxicity Characteristic criteria.” Businesses that emit those chemicals in their waste streams might fall under RCRA hazardous waste regulations. (Call the Lincoln-Lancaster County Health Department [441-8040] or the Nebraska Department of Environmental Quality [471-2186] for more information about RCRA.)

Lead is used in many processes and in other chemicals. Cadmium is usually found in lead wastes as well. Mercury is commonly found in fluorescent light fixtures, thermostats, switches, and other devices and processes. These three metals are recoverable. Recovery and recycling are the best options for dealing with waste streams containing these metals.

The Waste Minimization Priority Chemicals list not only identifies the chemicals that cause many health and environmental concerns, it also can serve as a guideline for business owners to target waste reduction, pollution prevention, and recycling efforts. Finding effective but safer alternatives to the chemicals is the best business decision.

*Adapted from information found at <http://www.epa.gov/epaoswer/hazwaste/minimize/chemlist.htm#moreonWMPCs>.*



## FIND THE OPPORTUNITIES

Many P2 opportunities are hidden within systems. You might not notice or count the solvent that evaporates out of dip tanks or that drips off parts as they move from tank to tank or dry.

Create an assessment team or several teams, one per process. Include employees who work on the line. They know the processes and the problems better than any one. Many probably already have ideas about how to reduce waste in their processes. Someone who has the authority to make decisions and changes should also be included.

Chart the inputs and outputs: containers, pallets, evaporation, leaks, discharges, and unused materials. Start with the end waste streams and work “up channel” to determine where each waste came from. Identify which processes will result in the largest reductions. Set specific but realistic waste reduction goals.

Finding those hidden opportunities is how you can add up the savings. Having the right team(s) to

recognize and act on reduction opportunities will help you realize those savings.

The LLCHD can help. Call 441-8040 for information or assistance.



### Lincoln-Lancaster County Health Department

3140 N Street  
Lincoln, NE 68510-1514

<http://www.ci.lincoln.ne.us/city/health/envIRON/pollu/>

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**For more information or for P2 technical assistance, call 441-8040.**

Bruce Dart, M.S. .... Health Director  
Phil Rooney, Ph.D. .... Editor/Layout